

# *SINGLE COIL SOLENOID HAVING A PER- MANENT MAGNET WITH BI- DIRECTIONAL ASSIST*

## **Abstract**

A single coil solenoid includes a permanent magnet with bi-directional assist capabilities. The solenoid includes an armature that during de-energization of a single coil of wire is attracted to the permanent magnet thereby maintaining a hold position and during energization of the single coil has a polarity that repels the permanent magnet thereby creating a push/pull force. In this regard, the permanent magnet operates to not only hold the armature but also is used to push the armature when current is induced in the single coil.